

CLAIMS

1. A data transmission method used in a radio system comprising a subscriber terminal (200) and at least one base station (100) which transmits signals to the subscriber terminal by means of its antenna (140, 141),
5 **characterized by**

determining the quality of the signals received by the subscriber terminal by comparing the received signals with at least one signal quality threshold level,

10 sending to the base station (100), which transmitted the signal that exceeded the threshold, information on the antennas, which transmitted the signals that exceeded the threshold, or on the transmission directions from which the signal that exceeded the threshold was received,

15 selecting from the antennas, which transmitted the signal that exceeded the threshold, an antenna or antennas to continue the transmission of the signal to said subscriber terminal (200), or selecting from the transmission directions, from which the signal that exceeded the threshold was received, a transmission direction or directions, to which to continue the transmission of the signal to said subscriber terminal.

20 2. A data transmission method used in a radio system comprising a subscriber terminal (200) and at least one base station (100) which transmits signals to the subscriber terminal by means of its antenna (140, 141),
characterized by

25 determining the quality of the signals received by the subscriber terminal (200) by comparing the received signals with at least one signal quality threshold level, and

30 when only one signal exceeds the threshold, sending to the base station (100), which transmitted the signal that exceeded the threshold, a command to use, when transmitting a signal to said subscriber terminal, the antenna with which the signal that exceeded the threshold was transmitted, or the transmission direction to which the signal that exceeded the threshold was transmitted.

3. A method as claimed in claim 1, **characterized** in that when the quality of several signals is within the acceptable levels, information on the quality of the signals is sent to the base station (100), and the base

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station can, on the basis of the information, decide which antenna or direction it will use to continue transmitting the signal.

4. A method as claimed in claim 1, **characterized** in that the signals transmitted by the base stations are amplified by amplifiers (121), and in the method, the antenna which is connected to the amplifier with the lowest load is selected as the transmission antenna.

5. A method as claimed in claim 1, **characterized** in that the signals transmitted by the base stations are amplified by amplifiers (121) before transmission, and in the method, the selection decision is made on the basis of the load situation of the amplifiers.

6. A method as claimed in claim 1 or 2, **characterized** in that if the quality of the signal received by the subscriber terminal (200) is below the lowest acceptable quality level, information on the quality of the above-mentioned signal is sent to the base station which, after receiving the information, interrupts the transmission of the poor-quality signal.

7. A method as claimed in claim 1, **characterized** in that the signal is transmitted to the subscriber terminal (200) by means of beams, and the final decision on the transmission antenna, transmission direction or beam to be used by the base station is made in the base station (100).

8. A method as claimed in claim 2, **characterized** in that the signal is transmitted to the subscriber terminal (200) by means of beams, and the final decision on the transmission antenna, transmission direction or beam to be used by the base station is made in the subscriber terminal (200).

9. A method as claimed in claim 1, **characterized** in that the transmission beam of the base station causing the least interference is selected and the selection decision is made in the base station (100).

10. A method as claimed in claim 2, **characterized** in that the transmission beam of the base station causing the least interference is selected and the selection decision is made in the subscriber terminal (200).

11. A radio system comprising at least one subscriber terminal (200) and at least one base station (100) comprising an antenna (140, 141) by means of which the base station transmits signals to the subscriber terminal, **characterized** in that

the subscriber terminal comprises a measuring means (230) which determines the quality of the signals received by the subscriber terminal by comparing the received signals with at least one signal quality threshold level,

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the subscriber terminal sends to the base station, which transmitted the signal that exceeded the threshold, information on the antennas by which the signal that exceeded the threshold was transmitted, or information on the transmission directions from which the signal that exceeded the threshold was received,

the base station (100) comprises a means (102) which selects from the antennas (140, 141), which transmitted the signals that exceeded the threshold, an antenna or antennas which continue to transmit the signal to said subscriber terminal (200), or the means (102) selects from the transmission directions of the signals, which exceeded the threshold, a transmission direction or directions to which the base station continues to transmit the signal.

12. A radio system comprising at least one subscriber terminal (200) and at least one base station (100) comprising an antenna (140, 141) by means of which the base station transmits signals to the subscriber terminal, **characterized** in that

the subscriber terminal (200) comprises a measuring means (230) which determines the quality of the signals received by the subscriber terminal by comparing the received signals with at least one signal quality threshold level, and

when only one signal exceeds the threshold, the subscriber terminal (200) sends to the base station (100), which transmitted the signal that exceeded the threshold, a command to use, when transmitting a signal to said subscriber terminal, the antenna with which the signal that exceeded the threshold was transmitted, or the transmission direction to which the signal that exceeded the threshold was transmitted.

13. A radio system as claimed in claim 11, **characterized** in that when the quality of several signals is within the acceptable levels, the subscriber terminal (200) sends to the base station information, on the basis of which the base station can decide which antenna (140, 141) or direction the base station will use to continue transmitting the signal.

14. A radio system as claimed in claim 11, **characterized** in that the base station comprises amplifiers (121) which amplify the signals before their transmission, and the means (102) selects as the transmission antenna of the base station the antenna or antennas which are connected to the amplifier with the smallest load.

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15. A radio system as claimed in claim 11, **characterized** in that the base station comprises amplifiers (121) which amplify the signals before their transmission, and the means (102) makes the selection decision on the basis of the load situation of the amplifiers (121).

5 16. A radio system as claimed in claim 11 or 12, **characterized** in that if the quality of the signal received by the subscriber terminal is below the lowest acceptable quality level, the subscriber terminal (200) sends information on the quality of the above-mentioned signal to the base station which, after receiving the information, stops transmitting the
10 signal with the antenna by which the signal that was below the threshold was transmitted.

17. A radio system as claimed in claim 11, **characterized** in that the base station (100) transmits the signal to the subscriber terminal (200) by means of beams, and the final decision on the transmission antenna,
15 transmission direction or beam to be used in the base station is made in the base station (100).

18. A radio system as claimed in claim 12, **characterized** in that the base station (100) transmits the signal to the subscriber terminal (200) by means of beams, and the final decision on the transmission antenna,
20 transmission direction or beam to be used in the base station (100) is made in the subscriber terminal (200).

19. A radio system as claimed in claim 11, **characterized** in that the base station comprises a means (102) which selects as the transmission beam of the base station the transmission beam causing the
25 least interference.

20. A radio system as claimed in claim 12, **characterized** in that the subscriber terminal comprises a means (202) which selects as the transmission beam of the base station the transmission beam causing the least interference.

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